Kenyon hard red spring wheat

Hughes, G. R. and Hucl, P. 1991. **Kenyon hard red spring wheat**. Can. J. Plant Sci. **71**: 1165–1168.
Kenyon hard red spring wheat (*Triticum aestivum* L.) possesses excellent resistance to leaf rust and stem rust. Kenyon was developed using the backcross breeding method, resulting in the recovery of the maturity and wide adaptation of its recurrent parent Neepawa. Kenyon was developed at the University of Saskatchewan.

Key words: Cultivar description, leaf rust, *Triticum aestivum* L., spring wheat

Hughes, G. R. et Hucl, P. 1991. **Le blé roux vitreux de printemps Kenyon.** Can. J. Plant Sci. **71**: 1165–1168. Kenyon, nouveau cultivar de blé roux vitreux de printemps (*Triticum aestivum* L.), dénote une excellente résistance aux rouilles des feuilles et de la tige. Créé à l'Université de la Saskatchewan, il a hérité de la précocité et de la grande souplesse d'adaptation de son parent récurrent Neepawa.

Mots clés: Description de cultivar, rouille des feuilles, *Triticum aestivum* L., blé de printemps

Kenyon hard red spring wheat (*Triticum aestivum* L.) was developed jointly by the Department of Crop Science and Plant Ecology and the Crop Development Centre, University of Saskatchewan. License No.2556 was issued for Kenyon on 7 Nov. 1985 by the Food Production and Inspection Branch, Seed Division, Variety Registration Office, Agriculture Canada, Ottawa.

Pedigree and Breeding Method

Kenyon was selected from the cross Neepawa*5/Buck Manantial.The backcross breeding method was used to incorporate leaf rust resistance from the Argentinian cultivar Buck Manantial in a line with the maturity and general adaptation of Neepawa red spring wheat. The first cross was made in 1973 and backcrossing was completed in 1976. The F_2 generation from BC_5 was grown in the greenhouse in 1977 and F_3 head rows from selected BC_5 F_2 plants were grown in the field in 1978. Sixty-four F_3-derived lines were evaluated for yield and quality in tests at Saskatoon during 1979 to 1981.

One F_3-derived F_6 line (W80084) was tested as BW571 in the Western Bread Wheat Cooperative Test for 3 yr (1982-1984) and in the Central Bread Wheat Co-operative Test for 2 yr (1983 and 1984). Breeder seed of Kenyon consists of 183 breeder lines which are individually maintained. The 183 lines were originally selected from about 225 head rows first grown in 1982.

Performance and Adaptation

The grain yield of Kenyon was similar to that of the checks (Tables 1 and 2).

Kenyon is similar to Neepawa in maturity, height, lodging resistance and test weight (Tables 3 and 4). The kernel size of Kenyon is intermediate between that of Benito and Neepawa (Table 4) and significantly lower than that of Sinton (Table 4) and Columbus (Tables 3 and 4).

Kenyon is resistant to prevalent races of leaf and stem rust and possesses leaf rust resistance genes *Lr 13* and *Lr 16* (Dyck 1989). Kenyon has superior leaf and stem rust resistance relative to Neepawa and Columbus (Table 5). Kenyon is superior to Neepawa in common bunt and loose smut resistance but inferior for common root rot resistance (Table 5).

Kenyon is particularly adapted to the eastern Prairie wheat growing regions where leaf and stem rust are potential hazards to production.

Table 1. Grain yield ('00 kg ha^{-1}) of Kenyon wheat and check cultivars in Western Bread Wheat Cooperative Tests, 1982–1984

Cultivar	Brown soil zone[z]	Dark Brown soil zone	Black soil zone	Mean
Neepawa	27.9	26.5	33.1	27.2
Columbus	27.1	27.1	39.5	27.8
Kenyon	27.3	27.1	33.1	27.4
SE	0.9	0.3	–	0.3
	(6)[y]	(18)	(1)	(25)

[z]Brown soil zone sites are Swift Current, Stewart Valley or Kindersley; Dark Brown soil zone sites are Lethbridge, Regina, Watrous, Rosetown, Saskatoon, Scott or Acme; the Black soil zone site is Ellerslie.
[y]Number of station-years.

Table 2. Grain yield ('00 kg ha^{-1}) of Kenyon wheat and check cultivars in Central Bread Wheat Cooperative Tests, 1983–1984

Cultivar	Dark Brown soil zone[z]	Black soil zone	Mean
Neepawa	27.6	31.5	30.7
Sinton	26.1	30.4	29.5
Benito	26.7	31.1	30.2
Columbus	28.8	29.5	29.3
Kenyon	27.5	30.6	30.0
SE	0.5	0.4	0.4
	(4)[y]	(16)	(20)

[z]Dark Brown soil zone sites are Regina and Saskatoon; Black soil zone sites are Glenlea, Morden, Portage la Prairie, Brandon, Dauphin, Indian Head, Yorkton and Melfort.
[y]Number of station-years.

Other Characteristics

GROWTH HABIT. Spring

COLEOPTILE COLOR. Green

LEAVES. Medium green, glabrous, slight waxy bloom.

TILLERS. Intermediate number.

CULM. Slight waxy bloom on upper internode, little or no anthocyanin at maturity, fine straight neck, hollow internodes, three nodes.

HEADING. Mid-season, similar to Neepawa.

PHOTOPERIOD RESPONSE. Sensitive.

SAWFLY REACTION. Susceptible.

SHATTERING. Resistant, similar to Neepawa.

SPROUTING TENDENCY. Medium, similar to Neepawa.

Spike Characteristics

AWNS. Apically awnletted.

SHAPE. Strap or oblong, mid-dense, mid-long.

ATTITUDE. Erect.

GLUMES. Glabrous, white at maturity, mid-wide, mid-long; shoulders square, mid-wide; beaks narrow, acute, slight basal folds.

Kernel Characteristics

COLOR. Medium red.

TEXTURE. Hard.

SHAPE. Small- to mid-size, mid-wide, mid-long, ovate.

GERM. Mid-size, round.

CREASE. Mid-wide, mid-deep.

CHEEKS. Angular to rounded.

BRUSH. Mid-long.

GRADE ELIGIBILITY. Top grades of Canadian Western Red Spring Wheat.

Disease Reaction

Resistant to prevalent races of leaf rust (caused by *Puccinia recondita* Rob. ex Desm. f. sp. *tritici*) and stem rust caused by *Puccinia graminis* Pers. f. sp. *tritici* Eriks. & E. Henn.); moderately resistant to common bunt (caused by *Tilletia foetida* (Wallr.) Liro and *T. caries* (DC.) Tul.), and loose smut (caused by *Ustilago tritici* (Pers.) Rostr.), moderately susceptible to common root rot (caused by *Bipolaris sorokiniana* (Sacc. in Sorok.) Shoem.).

Maintenance and Distribution of Pedigreed Seed

Breeder seed will be maintained by the Crop Development Centre, University of Saskatchewan, Saskatoon, Saskatchewan, Canada S7N 0W0. Distribution and multiplication of pedigreed seed stocks is handled by SeCan Association, 200-57 Auriga Drive, Nepean, Ontario, Canada K2E 8B2.

Table 3. Agronomic characteristics of Kenyon wheat and check cultivars in Western Bread Wheat Cooperative Tests, 1982–1984

Cultivar	Maturity (d)	Height (cm)	Lodging (1-9)[z]	Test wt (kg hL^{-1})	1000-kernel wt (g)
Neepawa	100	82	1.5	79.0	30.0
Columbus	103	90	1.3	80.0	31.2
Kenyon	99	83	1.4	78.7	28.9
SE	0.3 (17)[y]	0.8 (23)	0.1 (13)	0.1 (26)	0.2 (26)

[z] 1 = no lodging, 9 = completely lodged.
[y] Number of station-years.

Table 4. Agronomic characteristics of Kenyon wheat and check cultivars in Central Bread Wheat Cooperative Tests, 1983–1984

Cultivar	Maturity (d)	Height (cm)	Lodging (1-9)[z]	Test wt (kg hL^{-1})	1000-kernel wt (g)
Neepawa	95	93	1.5	78.5	30.3
Sinton	97	96	1.3	78.3	31.8
Benito	94	92	2.0	77.8	28.6
Columbus	98	98	1.4	79.0	31.6
Kenyon	95	93	2.6	78.5	29.3
SE	0.3 (17)[y]	0.6 (18)	0.2 (9)	0.2 (20)	0.3 (20)

[z] 1 = no lodging, 9 = completely lodged.
[y] Number of station-years.

Appreciation is expressed to D. Lucuik, K. Wu, E. Ostlund, and D. Bergh for their technical assistance in developing this rust resistant bread wheat cultivar.

Dyck, P. 1989. The inheritance of leaf rust resistance in wheat cultivars Kenyon and Buck Manantial. Can. J. Plant Sci. **69**: 1113–1117.

G. R. Hughes[1] and P. Hucl[2]

[1]*Department of Crop Science and Plant Ecology, University of Saskatchewan, Saskatoon, Saskatchewan, Canada S7N 0W0; and* [2]*Crop Development Centre, University of Saskatchewan, Saskatoon, Saskatchewan, Canada S7N 0W0.* *Received 12 Apr. 1991. accepted 10 June 1991.*

Table 5. Disease reactions of Kenyon and check cultivars, Western Bread Wheat Cooperative Tests, 1982-1984

Year	Leaf rust	Stem rust	Common bunt	Loose smut	Common root rot
			Neepawa		
1982	40MS[z]	VR	3R	16MR	25[y]
1983	50M	10R	8I	25MR[x]	12
1984	50M	10R	33I	23MR[x]	31
			Columbus		
1982	VR	10MR-MS	1R	61S	40**
1983	5R	10R	3R	24MR[x]	22**
1984	1R	20R-MR	9R	34MS[x]	35
			Kenyon		
1982	VR	VR	2R	0R	36*
1983	TR	5R	0R	17MR[x]	16
1984	0TR	5VR	31I	7R[x]	36

[z] Percent infection and reaction type. TR = trace resistant; VR = very resistant; R = resistant; MR = moderately resistant; I = intermediate resistance; M = intermediate to MR and MS; MS = moderately susceptible; S = susceptible.
[y] Disease index.
[x] Data from the Central Bread Wheat Cooperative Test.
*,** Differed from Neepawa at the 5 and 1% probability levels, respectively. SE = 2.1, Station-years = 8.